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| EXAMINER | |
|---|---|
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| ART UNIT | PAPER NUMBER |
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| 1714 | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/733,062 | GUO ET AL. | |
| | Examiner | Art Unit | |
| | Sandra K. Poulos | 1714 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *11 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 3/28/05; 9/27/04; 3/22/04; 3/15/04
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Specification*

1. The abstract of the disclosure is objected to because it is of improper length. Abstract must be greater than 50 words. Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### *Claim Objections*

3. Claims 2, 4, 10, 11, 17, 19 and 20 are objected to because of the following informalities:

Claims 2, 4, 10, 11, 17, 19, and 20 improperly recite Markush groups. Currently the phraseology is "selected from A, B, and C". This phraseology should be corrected to "selected from the group consisting of A, B, and C" or "selected from A, B, or C".

Claim 11 is unclear because of the phrase "any of claim 9"; examiner has assumed that claim 11 is referring only to claim 9.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 14-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear what is being illustrated by the formulae. It is not known if the formula in claim 14 shows a structural repeat unit (because of the open ends on the structure), or what is attached at the open end of the formula in claim 15, or if the formulae are meant to show a part of a larger monomer structure.

Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being dependent upon a rejected base claim.

### *Double Patenting*

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Seven obviousness-type double patenting rejections are set forth below, regarding (1) US 6,352,782; (2) US 6,617,398; (3) US 6,627,704; (4) US 6,812,276; (5) US 6,878,781; (6) US 6,878,782; and (7) US 6,905,637. Rejections are set forth on pages 4-18.

*Double Patenting* (1)

5. Claims 1-4, 7, 9-11, 13-17, 19-25, 29 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-12 and 22-42 of U.S. Patent No. 6,352,782 in view of Industrial Minerals and Their Uses.

The claims of US 6,352,782 disclose a curable resin comprising a functionalized PPE resin and an alkenyl aromatic monomer or acrylate monomer or allylic monomer. The composition contains fillers (claim 11).

The independent claim does not include filler or indicate particle size of the filler.

Applicant's attention is drawn to M.P.E.P. § 804 where it is disclosed that "the specification can always be used as a dictionary to learn the meaning of a term in a patent claim." *In re Boylan*, 392 F. 2d 1017, 157 USPQ 370 (CCPA 1968). Further, those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in an application defines an obvious variation of an invention claimed in the patent. *In re Vogel*, 422 F. 2d 438, 164 USPQ 619, 622 (CCPA 1970).

The specification of 6,352,782 discloses particulate fillers such a talc, clay, mica, silica, alumina, and calcium carbonate (col 14, lines 64-66; col 13, lines 38-46). Further, it is known in the art that filler with nanoscale dimensions beneficially reinforce polymer compositions; for example, Industrial Minerals discloses that for fillers to be truly useful as reinforcing fillers in polymer compositions, they should range in size from 10 to 100 nm. Filler with large particle sizes have no significant affect, positive or negative (last paragraph pg 221 to top 222).

Therefore it would have been obvious to one skilled the art to use nanoscale filler with the composition in the claims of US 6,352,782.

6. Claims 1-4, 7, 9-11, 13-17, 19-25, 29 are directed to an invention not patentably distinct from claims 1-12 and 22-42 of commonly assigned US 6,352,782. Specifically, although the conflicting claims are not identical, they are not patentably distinct for the reasons set forth in paragraph 5 above.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned US 6,352,782, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

7. Claims 1-4, 7, 9-11, 13-17, 19-25, 29 are rejected under 35 U.S.C. 103(a) as being obvious over US 6,352,782 in view of Industrial Minerals and Their Uses.

The applied reference has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only

under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

For an explanation of the rejection, see paragraph 5 above.

*Double Patenting* (2)

8. Claims 1-4, 6-18, 20, 22-25, 29 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-49 of U.S. Patent No. 6,617,398 in view of Industrial Minerals and Their Uses.

The claims of US 6,617,398 disclose a curable resin comprising a functionalized PPE resin and an alkenyl aromatic monomer or acrylate monomer. The composition contains fillers (claim 20, 44).

The independent claim does not include filler or indicate particle size of the filler.

Applicant's attention is drawn to M.P.E.P. § 804 where it is disclosed that "the specification can always be used as a dictionary to learn the meaning of a term in a patent claim." *In re Boylan*, 392 F. 2d 1017, 157 USPQ 370 (CCPA 1968). Further, those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in an application defines an obvious variation of an invention claimed in the patent. *In re Vogel*, 422 F. 2d 438, 164 USPQ 619, 622 (CCPA 1970).

The specification of 6,617,398 discloses particulate fillers such a talc, clay, mica, silica, alumina, and calcium carbonate (col 14 lines 62-64; col 13, lines 36-44). Further, it is known in the art that filler with nanoscale dimensions beneficially reinforce polymer compositions; for example, Industrial Minerals discloses that for fillers to be truly useful as reinforcing fillers in polymer compositions, they should range in size from 10 to 100 nm. Filler with large particle sizes have no significant affect, positive or negative (last paragraph pg 221 to top 222). Therefore it would have been obvious to one skilled the art to use nanoscale filler with the composition in the claims of US 6,617,398.

9. Claims 1-4, 6-18, 20, 22-25, 29 are directed to an invention not patentably distinct from claims 1-49 of commonly assigned US 6,617,398. Specifically, although the conflicting claims are not identical, they are not patentably distinct for the reasons set forth in paragraph 8 above.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned US 6,617,398, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the

commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

10. Claims 1-4, 6-18, 20, 22-25, 29 are rejected under 35 U.S.C. 103(a) as being obvious over US 6,617,398 in view of Industrial Minerals and Their Uses.

The applied reference has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

For an explanation of the rejection, see paragraph 8 above.

*Double Patenting* (3)

11. Claims 1-4, 6-18, 20, 22-25, 29 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-33 of U.S. Patent No. 6,627,704 in view of Industrial Minerals and Their Uses.

The claims of US 6,627,704 disclose a thermoset composition comprising a functionalized PPE resin and an alkenyl aromatic monomer and acryloyl monomer. The composition contains fillers (claim 21).

Claims 17-18, 31 disclose that the thermoset composition further comprises a curing catalyst, which gives evidence that the thermoset composition is not yet completely cured and thus is curable.

The independent claim does not include filler or indicate particle size of the filler.

Applicant's attention is drawn to M.P.E.P. § 804 where it is disclosed that "the specification can always be used as a dictionary to learn the meaning of a term in a patent claim." *In re Boylan*, 392 F. 2d 1017, 157 USPQ 370 (CCPA 1968). Further, those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in an application defines an obvious variation of an invention claimed in the patent. *In re Vogel*, 422 F. 2d 438, 164 USPQ 619, 622 (CCPA 1970).

The specification of 6,627,704 discloses particulate fillers such a talc, clay, mica, silica, alumina, and precipitated calcium carbonate (col 15 line 61 to col 17 line 67). Further, it is known in the art that filler with nanoscale dimensions beneficially reinforce polymer compositions; for example, Industrial Minerals discloses that for fillers to be truly useful as reinforcing fillers in polymer compositions, they should range in size from 10 to 100 nm. Filler with large particle sizes have no significant affect, positive or negative (last paragraph pg 221 to top 222). Therefore it would have been obvious to one skilled the art to use nanoscale filler with the composition in the claims of US 6,627,704.

12. Claims 1-4, 6-18, 20, 22-25, 29 are directed to an invention not patentably distinct from claims 1-33 of commonly assigned US 6,627,704. Specifically, although the conflicting claims are not identical, they are not patentably distinct for the reasons set forth in paragraph 11 above.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned US 6,627,704, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under

35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

13. Claims 1-4, 6-18, 20, 22-25, 29 are rejected under 35 U.S.C. 103(a) as being obvious over US 6,627,704 in view of Industrial Minerals and Their Uses.

The applied reference has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

For an explanation of the rejection, see paragraph 11 above.

*Double Patenting* (4)

14. Claims 1-15, 18-25, 29 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-34 of U.S. Patent No. 6,812,276 in view of Industrial Minerals and Their Uses.

The claims of US 6,812,276 disclose a curable resin comprising a PPE resin and an alkenyl aromatic monomer and acryloyl monomer. The composition contains fillers including several types of clay/silicates and fibers (claims 21-26). Claim 24 discloses carbon fibers of diameter 3.5 to 500 nm. The independent claim is silent with respect to inclusion of nanofillers.

It is known in the art that filler with nanoscale dimensions beneficially reinforce polymer compositions; for example, Industrial Minerals discloses that for fillers to be truly useful as reinforcing fillers in polymer compositions, they should range in size from 10 to 100 nm. Filler with large particle sizes have no significant affect, positive or negative (last paragraph pg 221 to top 222). Therefore it would have been obvious to one skilled the art to use nanoscale filler in the composition in the claims of US 6,812,276.

15. Claims 1-15, 18-25, 29 are directed to an invention not patentably distinct from claims 1-34 of commonly assigned U.S. Patent No. 6,812,276. Specifically, although the conflicting claims are not identical, they are not patentably distinct for the reasons set forth in paragraph 14 above.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned U.S. Patent No. 6,812,276, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

16. Claims 1-15, 18-25, 29 are rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,812,276 in view of Industrial Minerals and Their Uses.

The applied reference has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

For an explanation of the rejection, see paragraph 14 above.

*Double Patenting* (5)

17. Claims 1-4, 6-8, 13-25, 27-29 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-37 of U.S. Patent No. 6,878,781 in view of Industrial Minerals and Their Uses.

The claims of US 6,878,781 disclose a curable resin comprising a PPE resin and an acryloyl monomer. The composition contains fillers including several types of clay/silicates and fibers (claims 23-24).

The independent claim is silent with respect to inclusion of nanofillers.

Applicant's attention is drawn to M.P.E.P. § 804 where it is disclosed that "the specification can always be used as a dictionary to learn the meaning of a term in a patent claim." *In re Boylan*, 392 F. 2d 1017, 157 USPQ 370 (CCPA 1968). Further, those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in an application defines an obvious variation of an invention claimed in the patent. *In re Vogel*, 422 F. 2d 438, 164 USPQ 619, 622 (CCPA 1970).

The specification of US 6,878,781 discloses reinforcing fibers with a diameter of 3.5 to 500 nm and that there is at least 20 parts by weight present (col 11, lines 29, 50). Further, it is known in the art that filler with nanoscale dimensions beneficially reinforce polymer compositions; for example, Industrial Minerals discloses that for fillers to be truly useful as reinforcing fillers in polymer compositions, they should range in size from 10 to 100 nm. Filler with large particle sizes have no significant affect, positive or negative (last paragraph pg 221 to top 222). Therefore it would have been obvious to one skilled the art to use nanoscale filler in the composition in the claims of US 6,878,781.

18. Claims 1-4, 6-8, 13-25, 27-29 are directed to an invention not patentably distinct from claims 1-37 of commonly assigned U.S. Patent No. 6,878,781. Specifically, although the conflicting claims are not identical, they are not patentably distinct for the reasons set forth in paragraph 17 above.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned U.S. Patent No. 6,878,781, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as

prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

19. Claims 1-4, 6-8, 13-25, 27-29 are rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,878,781 in view of Industrial Minerals and Their Uses.

The applied reference has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

For an explanation of the rejection, see paragraph 17 above.

*Double Patenting* (6)

20. Claims 1-18, 20-26, 29 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-55 of U.S. Patent No. 6,878,782 in view of Industrial Minerals and Their Uses.

The claims of US 6,878,782 disclose a curable resin comprising a PPE resin and an acryloyl monomer and alkenyl aromatic monomer. The composition contains particulate fillers such as calcium carbonate (claims 43-45).

The independent claim is silent with respect to inclusion of nanofillers.

It is known in the art that filler with nanoscale dimensions beneficially reinforce polymer compositions; for example, Industrial Minerals discloses that for fillers to be truly useful as reinforcing fillers in polymer compositions, they should range in size from 10 to 100 nm. Filler with large particle sizes have no significant affect, positive or negative (last paragraph pg 221 to top 222). Therefore it would have been obvious to one skilled the art to use nanoscale filler in the composition in the claims of US 6,878,782.

21. Claims 1-18, 20-26, 29 are directed to an invention not patentably distinct from claims 1-55 of commonly assigned U.S. Patent No. 6,878,782. Specifically, although the conflicting claims are not identical, they are not patentably distinct for the reasons set forth in paragraph 20 above.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned U.S. Patent No. 6,878,782, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to

resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

22. Claims 1-18, 20-26, 29 are rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,878,782 in view of Industrial Minerals and Their Uses.

The applied reference has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

For an explanation of the rejection, see paragraph 20 above.

*Double Patenting* (7)

23. Claims 1-18, 20, 22-25 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-32 of U.S. Patent No. 6,905,637 in view of Industrial Minerals and Their Uses.

The claims of US 6,905,637 disclose a thermoset composition comprising a functionalized PPE resin and an alkenyl aromatic monomer and acryloyl monomer. Claims 20-21 disclose that the thermoset composition further comprises a curing catalyst, which gives evidence that the thermoset composition is not yet completely cured and thus is curable. The composition contains fillers (claim 24). Claim 32 discloses carbon fibers of diameter 3.5 to 500 nm. The independent claim is silent with respect to inclusion of nanofillers.

It is known in the art that filler with nanoscale dimensions beneficially reinforce polymer compositions; for example, Industrial Minerals discloses that for fillers to be truly useful as reinforcing fillers in polymer compositions, they should range in size from 10 to 100 nm. Filler with large particle sizes have no significant affect, positive or negative (last paragraph pg 221 to top 222). Therefore it would have been obvious to one skilled the art to use nanoscale filler for in the composition in the claims of US 6,905,637.

24. Claims 1-18, 20, 22-25 are directed to an invention not patentably distinct from claims 1-32 of commonly assigned U.S. Patent No. 6,905,637. Specifically, although the conflicting claims are not identical, they are not patentably distinct for the reasons set forth in paragraph 23 above.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned U.S. Patent No. 6,905,637, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show

that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

25. Claims 1-18, 20, 22-25 are rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,905,637 in view of Industrial Minerals and Their Uses.

The applied reference has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

For an explanation of the rejection, see paragraph 23 above.

***Claim Rejections - 35 USC § 103***

26. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

27. Claims 1-4, 6-20, 22-25, 27, 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/40354 (cited as an X reference on the international search report) in view of Industrial Minerals and Their Uses.

WO '354 discloses a capped polyphenylene ether (PPE) resin combined with a curable unsaturated monomer (pg 7, lines 18-22). The PPE has the general formula of $Q(J\text{-}K)_y$ (pg 8-11). Examples of fillers include silica powder, alumina, clays such as wollastonite, mica, and talc (pg 18 line 3 to pg 19 line 18; pg 20, lines 1-2). Curing catalysts that are peroxy based radical initiators are disclosed (pg 16 lines 7-20). The composition contains flame retardant compounds (pg 17, lines 4-21) and optionally stabilizers, lubricants, dyes, etc (pg 20, lines 10-13). The preferable capped PPEs include methacrylate capped PPEs (pg 11, lines 10-14). In the examples, MAA capped PPE is combined with monomers such as dibromostyrene, tetramethylolpropane tetraacrylate, hexanediol dimethyacrylate, and diallylphthalate (examples; also see pgs 14-15).

WO '354 does not (1) expressly disclose the size of the filler (i.e. that it is a nanofiller) or (2) disclose specific mixing steps in making the composition.

With respect to (1), Industrial Minerals discloses that for fillers to be truly useful as reinforcing fillers in polymer compositions, they should range in size from 10 to 100 nm. Filler with large particle sizes have no significant affect, positive or negative (last paragraph pg 221 to top 222).

Thus it would have been obvious to one of ordinary skill in the art to use the fillers in WO '354 in the particle size range disclosed by Industrial Minerals so that they would have a positive reinforcing affect on the composition.

With respect to (2), WO '354 discloses that the curable composition may be dissolved in an effective amount of an inert organic solvent (pg 20 lines 14-15). In example 2 the methacrylate capped PPE is dissolved in solvent and vinyl monomer; the resin solution then has the filler added (pg 21). In example 3 the methacrylate capped PPE is dissolved in vinyl monomer (pg 23). However, WO '354 discloses that the order of blending and dissolution is not critical (pg 20 line 18). Additionally, case law holds that the selection of any order of mixing ingredients is *prima facie* obvious. *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930). WO '354 suggests through the examples that the filler should be added to the PPE/monomer in a separate step, which is a common feature with the current methods.

Thus it would have been obvious to one of ordinary skill in the art to mix the nanofiller with a polymer or solvent prior to adding to the PPE/monomer mixture since WO '354 is open as to the order of blending and dissolution.

28. Claims 21 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO '354 in view of Industrial Minerals as applied to claims 1-4, 6-20, 22-25, 29-31 above, and further in view of EP 732371.

The discussion with respect to WO '354 and Industrial Minerals in paragraph 27 above is incorporated herein by reference.

WO '354 and Industrial Minerals do not give any indication of the amount of nanofiller that is used in the composition.

EP '371 discloses a structurally similar PPE resin to those in WO '354 and the currently claimed (pg 3), alkenyl aromatic monomers (pg 9 lines 25-46), and reinforcing fillers such as fibrous filler and non-fibrous fillers like talc, micas, and quartzes which are present in an amount up to 50% (pg 9 lines 16-24).

The composition in EP '371 is very similar to that in WO '345 and the currently claimed, thus it would have been obvious to one of ordinary skill in the art to use the filler in WO '345 in the amount given by EP '371 and to have a reasonable expectation of success.

29. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO '354 in view of Industrial Minerals as applied to claims 1-4, 6-20, 22-25, 29-31 above, and further in view of Kawasumi et al in US 4,810,734.

The discussion with respect to WO '354 and Industrial Minerals in paragraph 27 above is incorporated herein by reference.

WO '354 is silent with respect to swelling agents.

Kawasumi discloses a process for producing a composite material composed of a polymer and layered silicate with a swelling agent (abstract). The swelled layered silicate is dispersed with monomer that is polymerized (abstract). The process permits the economical and efficient production of a composite material in which the layered silicate is uniformly dispersed (abstract). The polymer can include polyphenylene oxide (claim 6).

It would have been obvious to one of ordinary skill in the art to introduce a swelling agent to the clays in WO '354 so to result in better compatibility and dispersion between the filler and polymer.

30. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO '354 in view of Industrial Minerals as applied to claims 1-4, 6-20, 22-25, 29-31 above, and further in view of Yeager et al in US 6,905,637.

The discussion with respect to WO '354 and Industrial Minerals in paragraph 27 above is incorporated herein by reference.

WO '354 is silent with respect to the mixing energy of the composition.

Yeager discloses a functionalized poly(arylene ether) with alkenyl and acryloyl monomer and fillers such as silica, alumina, wollastonite (col 18, lines 3-37). Yeager discloses that it has been found that a desirable balance of mechanical and electrical properties may be obtained when the curable composition is mixed with a mixing energy of less than 50 kj/L (col 24, lines 22-25).

Thus it would have been obvious to one of ordinary skill in the art to use a mixing energy of less than 50 kj/L in the in the composition of WO '354 for the reasons in Yeager col 24, lines 22-25, cited above.

***Conclusion***

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sandra K. Poulos whose telephone number is (571) 272-6428. The examiner can normally be reached on M-F 7:30-4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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